

IN THE CLAIMS:

1. (Currently amended) An apparatus for detecting cell chemotaxis and for isolating chemotactic cells, the apparatus including a cell observation chamber and a solution temperature control device, said cell observation chamber comprising:

a dish-shaped bottom support body with a window, for observing the movement of cells, provided in the center of a bottom part thereof,

a glass substrate adapted to be placed on a bottom surface of said bottom support body;

a dish-shaped intermediate support body with an opening portion formed in the center of a bottom part thereof, said intermediate support body being adapted to be attached to said bottom support body to press and fix said glass substrate from above onto bottom surface of said bottom support body;

a substrate with a plurality of through holes for guiding cell suspension containing solution and chemotactic factor containing solution therethrough, said substrate being adapted to be fixed onto a surface of a central part of said glass substrate, said substrate having at least a pair of wells and a flow path for fluid communication between said wells formed in a surface facing said glass substrate;

a packing member with a plurality of through holes for guiding said cell suspension containing solution and said chemotactic factor containing solution therethrough, said packing member being adapted to be fitted into said opening that is formed in the center of the bottom part of said intermediate support body to press said substrate from above;

a dish-shaped cover block body with a plurality of through holes for guiding said cell suspension containing solution and said chemotactic factor containing solution therethrough formed in the center of a bottom part thereof, said cover block body being adapted to be attached to said bottom support body with said intermediate support body attached thereto to press and fix said substrate from above onto said glass substrate through said packing member; and

said solution temperature control device comprising:

a heating section, exterior to the cell observation chamber, for heating said cell

observation chamber;

a first temperature controller comprising a first temperature sensor with a temperature sensing part for measuring the temperature of said heating section immersed in a solution within said cell observation chamber to directly measure the temperature of said solutions filling said pair of wells and said flow path, said first temperature controller controlling preheating of said heating section the temperature of said solutions up to be a predetermined preheating temperature with feedback of the temperature of said heating section directly measured by said first temperature sensor and, subsequent to preheating of said heating section, monitoring the temperature of said heating section and preventing an abnormal increase in temperature of said heating section;

a second temperature controller, operative after said heating section has been preheated, said second temperature controller comprising a second temperature sensor with a temperature sensing part immersed in a solution within said cell observation chamber to directly measure the temperature of said solutions filling said pair of wells and said flow path for measuring the temperature of a heating section external to the cell observation chamber, said heating section heating said cell observation chamber from outside, thereby indirectly heating said solutions filling said pair of wells and said flow path, said second temperature controller controlling said heating section to heat said solution to be a predetermined solution preheating temperature and to maintain the predetermined solution temperature with feedback of the temperature of the solution directly measured by said second temperature sensor; and

a changeover switch for switching connection of the heating section between the first and second temperature controllers, whereby the heating section is operated under control of either the first temperature controller or the second temperature controller.

2. (Canceled)

3. (Canceled)

4. (Currently amended) The apparatus for detecting cell chemotaxis and for isolating chemotactic cells according to claim 1 wherein:

said second first temperature sensor is attached detachably to said cell observation chamber, and has its temperature sensing part immersed in solution in a liquid storage chamber formed in said cell observation chamber in an isolated position where said solution therein is indirectly heated by said heating section equally with said solutions filling said pair of wells and said flow path and where said liquid storage chamber is separate from and connected to said pair of wells and said flow path.

5. (Canceled)

6. (Canceled)

7. (New) The apparatus for detecting cell chemotaxis and for isolating chemotactic cells according to claim 1 further comprising a relay switch and wherein said first temperature controller responds to sensing, by said first temperature sensor, of an abnormal increase in temperature of said heating section, by operation of said relay switch to shut off said heating section.